

IN THE CLAIMS:

Page 35, before Claim 1, delete:

~~CLAIMS~~

Page 35, before Claim 1, insert:

WHAT IS CLAIMED IS:

Please cancel claims 1-52 without prejudice or disclaimer, and substitute new
Claim 53-112 therefor as follows:

Claims 1-52 (Cancelled).

53. (New) An optical fiber comprising:

a glass portion; and

at least one protective coating layer disposed to surround said glass portion;

said protective coating layer having a modulus of elasticity value between -40°C
and +60°C between 5 MPa and 600 MPa.

54. (New) The optical fiber according to claim 53, wherein the modulus of elasticity
value is not higher than 500 MPa.

55. (New) The optical fiber according to claim 54, wherein the modulus of elasticity
value is not higher than 450 MPa.

56. (New) The optical fiber according to claim 55, wherein the modulus of elasticity
value is not higher than 300 MPa.

57. (New) The optical fiber according to claim 53, wherein the modulus of elasticity value is not lower than 8 MPa.
58. (New) The optical fiber according to claim 56, wherein the modulus of elasticity value is higher than 12 MPa.
59. (New) The optical fiber according to claim 53, wherein the protective coating layer is disposed in contact with said glass portion.
60. (New) The optical fiber according to claim 53, wherein the protective coating layer is a single protective coating layer which is disposed in contact with said glass portion.
61. (New) The optical fiber according to claim 53, wherein variation (V_1) between the modulus of elasticity value measured at -40°C and the modulus of elasticity value measured at $+60^{\circ}\text{C}$ of the protective coating layer, is not higher than 495 MPa.
62. (New) The optical fiber according to claim 61, wherein the variation (V_1) between the modulus of elasticity value measured at -40°C and the modulus of elasticity value measured at $+60^{\circ}\text{C}$ of the protective coating layer is not higher than 320 MPa.

63. (New) The optical fiber according to claim 62, wherein the variation (V_1) between the modulus of elasticity value measured at -40°C and the modulus of elasticity value measured at $+60^{\circ}\text{C}$ of the protective coating layer is not higher than 150 MPa.
64. (New) The optical fiber according to claim 53, wherein the protective coating layer has an equilibrium modulus (E.M.) higher than 5 MPa.
65. (New) The optical fiber according to claim 53, wherein the microbending variation (V_2) between -40°C and $+60^{\circ}\text{C}$, measured by winding a 100 m length fiber with a tension of 5 g on a 300 mm diameter expandable metallic bobbin coated with rough material, is not higher than 20 (dB/km) / (g/mm).
66. (New) The optical fiber according to claim 65, wherein the microbending variation (V_2) between -40°C and $+60^{\circ}\text{C}$, measured by winding a 100 m length fiber with a tension of 5 g on a 300 mm diameter expandable metallic bobbin coated with rough material, is not higher than 15 (dB/km) / (g/mm).
67. (New) The optical fiber according to claim 66, wherein the microbending variation (V_2) between -40°C and $+60^{\circ}\text{C}$, measured by winding a 100 m length fiber with a tension of 5 g on a 300 mm diameter expandable metallic bobbin coated with rough material, is not higher than 6 (dB/km) / (g/mm).

68. (New) The optical fiber according to claim 53, wherein the protective coating is obtained by curing a radiation curable composition comprising:

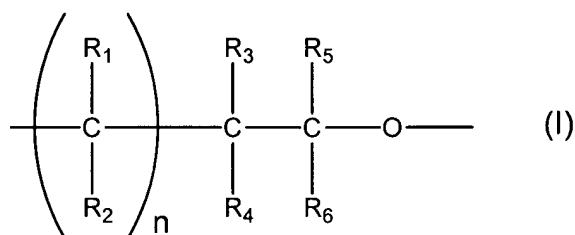
(a) at least one ethylenically unsaturated polyurethane having a glass transition temperature (T_g) between -40°C and -100°C ; and

(b) at least one polyfunctional reactive diluent monomer.

69. (New) The optical fiber according to claim 68, wherein the ethylenically unsaturated polyurethane (a) has a glass transition temperature (T_g) between -50°C and -85°C .

70. (New) The optical fiber according to claim 68, wherein the ethylenically unsaturated polyurethane (a) is obtained by reacting the following compounds:

(A) at least one polyol compound comprising a structural unit represented by the following formula (I):



wherein n is an integer from 0 to 4 inclusive; R_1 , R_2 , R_3 , R_4 , R_5 and R_6 , which may be equal or different from each other, represent a hydrogen atom or a $\text{C}_1\text{--C}_4$ alkyl group;

(B) at least one polyisocyanate compound; and

(C) at least one (meth) acrylate compound containing at least one hydroxyl group.

71. (New) The optical fiber according to claim 70, wherein the polyol compound (A) is selected from compounds obtained by polymerizing at least one compound selected from ethylene glycol, polyethylene glycol, propylene glycol, polypropylene glycol, tetramethylene glycol, 2-alkyl-1,4-butanediol and 3-alkyl-1,4-butanediol; compounds obtained by ring-opening polymerization of 2-alkyl-tetrahydrofuran or 3-alkyl-tetrahydrofuran; compounds obtained by copolymerization of 2-alkyl-tetrahydrofuran, 3-alkyl-tetrahydrofuran or 2-alkyl-1,4-butanediol, with a cyclic ether, or mixtures thereof.

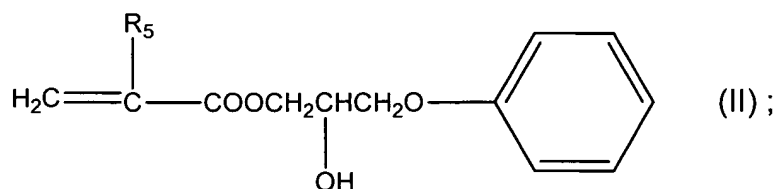
72. (New) The optical fiber according to claim 71, wherein the cyclic ether is selected from ethylene oxide, propylene oxide or tetrahydrofuran, or mixtures thereof.

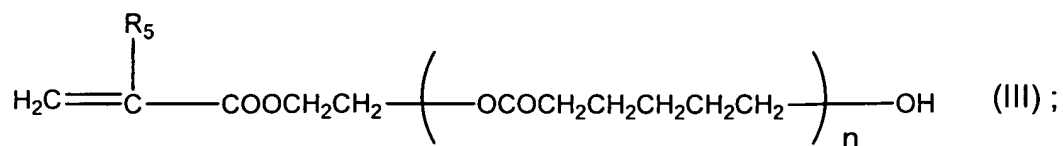
73. (New) The optical fiber according to claim 70, wherein the polyol compound (A) is selected from polybutadiene with a terminal hydroxyl group, hydrogenated polybutadiene with a terminal hydroxyl group, polyisobutylene polyol, 1,6-hexanediol, neopentyl glycol, 1,4-cyclohexane dimethanol, bisphenol A, bisphenol F, alkylene oxide adducts of bisphenol A, alkylene oxide adducts of bisphenol F, dimethylolized compound of dicyclopentadiene, polyester diols, polycaprolactone diols, polycarbonate diols, or mixtures thereof.

74. (New) The optical fiber according to claim 70, wherein the polyisocyanate compound (B) is selected from polyisocyanates of 2,4-tolylenediisocyanate, 2,6-

tolylenediisocyanate, 1,3-xylenediisocyanate, 1,4-xylenediisocyanate, 1,5-naphthalenediisocyanate, m-phenylenediisocyanate, p-phenylenediisocyanate, 3,3'-dimethyl-4,4'-diphenylmethanediisocyanate, 4,4'-diphenyl-methanediisocyanate, 3,3'-dimethylphenylenediisocyanate, 4,4'-biphenylenediisocyanate, 1,6-hexamethylenediisocyanate, isophoronediiisocyanate, methylenebis(4-cyclohexylisocyanate), 2,2,4-trimethylhexamethylenediisocyanate, 2,4,4-trimethylhexamethylenediisocyanate, 1,4-hexa-methylenediisocyanate, bis (2-isocyanateethyl)fumarate, 6-isopropyl-1,3-phenyldiisocyanate, 4-diphenylpropaneisocyanate, lysinediisocyanate, or mixtures thereof.

75. (New) The optical fiber according to claim 70, wherein the (meth)acrylate compound having at least one hydroxyl group (C) is selected from 2-hydroxyethyl-(meth)acrylate, 2-hydroxypropyl (meth)-acrylate, 2-hydroxy-3-phenyloxypropyl (meth)-acrylate, propanediol(meth)acrylate, 1,4-butanediolmono(meth)acrylate, 2-hydroxyalkyl-(meth)acryloyl phosphate, 4-hydroxycyclohexyl(meth)acrylate, 1,6-hexanediol-mono(meth)acrylate, neopentylglycolmono(meth)-acrylate, trimethylolpropane-di(meth)acrylate, trimethylolethanedimethacrylate, penta-erythritoltri(meth)acrylate, dipenta-erythritolpenta(meth)acrylate, (meth)acrylates represented by the following formulae (II) or (III):





wherein R₅ represents a hydrogen atom or a methyl group and n is an integer of from 1 to 15 inclusive; or mixtures thereof.

76. (New) The optical fiber according to claim 68, wherein the polyfunctional reactive diluent monomer (b) is selected from ethylene glycol di(meth)acrylate, tetraethylene glycol di(meth)acrylate, propanediol di(meth)acrylate, 1,4-butanediol di(meth)acrylate, trimethylolpropane di(meth)acrylate, trimethylolpropane tri(meth)acrylate, neopentyl glycol di(meth)acrylate, 1,6-hexanediol di(meth)acrylate, 1,6-hexamethylenedihydroxy di(meth)acrylate, polyethylene glycol di(meth)acrylate, polypropylene glycol di(meth)acrylate, hydroxypivalic acid neopentyl glycol ester di(meth)acrylate, trimethylolpropane tri(meth)acrylate, trimethylolpropanetrioxyethyl (meth)acrylate, tricyclodecanedimethanol di(meth)acrylate, dicyclopentadiene di(meth)acrylate, pentaerythritol tri(meth)acrylate, pentaerythritol tetra(meth)acrylate, pentaerythritol trioxyethyl (meth)acrylate, pentaerythritol tetraoxyethyl (meth)acrylate, di(meth)acrylate of a diol, the addition compound of ethylene oxide or propylene oxide with bisphenol A, hydrogenated bisphenol A glycidyl ether of bisphenol A, or mixtures thereof.

77. (New) The optical fiber according to claim 76, wherein the polyfunctional reactive diluent monomer (b) is 1,6-hexane diol diacrylate, pentaerythritol triacrylate, or a mixture of pentaerythritol triacrylate and pentaerythritol tetraacrylate.

78. (New) The optical fiber according to claim 68 wherein the radiation curable composition comprises at least one polymerization initiator (c).

79. (New) The optical fiber according to claim 78, wherein the polymerization initiator (c) is selected from benzophenone, benzoin, benzoinisobutyl ether, benzyl, benzoinethyl ether, 2,2-dimethoxy-2-phenylacetophenone, xanthone, fluorenone, 4-chlorobenzophenone, triphenylamine, carbazole, 3-methylacetophenone, 4,4'-dimethoxybenzophenone, 4,4'-diaminobenzophenone, Michler's ketone, benzoin propyl ether, acetophenone diethyl ketal, benzoin ethyl ether, 1-hydroxycyclohexylphenyl ketone, 2-hydroxy-2-methylpropiophenone, 4'-isopropyl-2-hydroxy-2-methylpropiophenone, α,α -dichloro-4-phenoxy-acetophenone, benzyl dimethyl ketal, 2,2-diethoxyacetophenone chlorothioxantone, 2-isopropylthioxantone, diethylthioxantone, 3,3-dimethyl-4-methoxybenzophenone, 2-methyl-1-[4-(methylthio)phenyl]-2-morpholinopropanone, α -hydroxycyclohexylphenyl ketone, 2,4,6-trimethylbenzoyldiphenylphosphine oxide, or mixtures thereof.

80. (New) The optical fiber according to claim 78, wherein the radiation curable composition comprises at least one photo-sensitizer (f).

81. (New) The optical fiber according to claim 80, wherein the photo-sensitizer (f) is selected from amines, ureas, phosphorus compounds, sulfur compounds, nitrils, or mixtures thereof.

82. (New) The optical fiber according to claims 80, wherein the polymerization initiator (c) and the photo-sensitizer (f) are present in the radiation curable composition in a total amount of from 0.01% by weight to 10% by weight with respect to the total weight of said radiation curable composition.

83. (New) The optical fiber according to claim 68, wherein the radiation curable composition comprises at least one monofunctional reactive diluent monomer (d).

84. (New) The optical fiber according to claim 83, wherein the monofunctional reactive diluent monomer (d) is selected from 2-hydroxyethyl (meth)acrylate; 2-hydroxypropyl (meth)acrylate; 2-ethylhexyl (meth)acrylate; butoxethyl (meth)acrylate; tetrahydrofurfuryl (meth)acrylate; linear or branched alkyl (meth)acrylates; n-hexyl (meth)acrylate; cyclohexyl (meth)acrylate; isobornyl (meth)acrylate; ethoxylatd alkyl (meth)acrylates; dicyclopentenyl (meth)acrylate; diethylene glycol (meth)acrylate; ethoxydiethylene glycol (meth)acrylate; benzyl (meth)acrylate; polyethylene glycol(meth)acrylate; polypropylene glycol (meth)acrylate; methoxypolyethylene glycol (meth)acrylate; methoxypolypropylene glycol (meth)acrylate; 2-phenoxyethyl (meth)acrylate; phoxypolyethylene glycol (meth)acrylate; alkylphenoxyethyl (meth)acrylate; alkylphoxypolyalkylene glycol (meth)acrylate; 2-hydroxy-3-phenyloxypropyl (meth)acrylate; tetra-hydrofurfuryloxypropylalkylene glycol (meth)-acrylate; dicyclopentenylxypolyalkylene glycol (meth)acrylate; 2-hydroxyalkyl (meth)acryloyl phosphate; polyfluroalkyl (meth)acrylate; N-vinyl pyrrolidone; N-vinyl caprolactam;

diacetone (meth)acrylamide; isobutoxymethyl (meth)acrylamide; N,N-dimethyl acrylamide; t-octyl (meth)acrylamide; dialkylaminoethyl (meth)acrylate; (meth)acryloylmorpholine; or mixtures thereof.

85. (New) The optical fiber according to claim 84, wherein the linear or branched alkyl (meth)acrylates are selected from butyl (meth)acrylate, octyl-(meth)acrylate, decyl (meth)acrylate, tridecyl (meth)acrylate, stearyl (meth)acrylate, lauryl (meth)acrylate, or isodecyl (meth)acrylate.

86. (New) The optical fiber according to claim 84, wherein the ethoxylated alkyl (meth)acrylates, are selected from methoxyethyl (meth)acrylate, ethoxylethyl (meth)acrylate, butoxyethyl (meth)acrylate, or 2-(2-ethoxyethoxy)ethyl (meth)acrylate.

87. (New) The optical fiber according to claim 84, wherein the alkylphenoxyethyl (meth)acrylate is nonylphenoxyethyl (meth)acrylate.

88. (New) The optical fiber according to claim 84, wherein the monofunctional reactive diluent monomer (d) is isobornyl acrylate, 2-phenoxyethyl acrylate, nonylphenoxyethyl acrylate, C₈-C₁₃ alkyl acrylates, lauryl acrylate, or isodecyl acrylate.

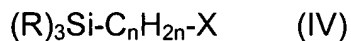
89. (New) The optical fiber according to claim 83, wherein the monofunctional reactive diluent monomer (d) is present in the radiation curable composition in an

amount of 3% by weight to 25% by weight with respect to the total weight of said radiation curable composition.

90. (New) The optical fiber according to claim 68 wherein the radiation curable composition comprises at least one adhesion promoter (e).

91. (New) The optical fiber according to claim 90, wherein the adhesion promoter (e) is an organo-functional silane selected from octyltriethoxysilane, methyltriethoxysilane, methyltrimethoxysilane, tris(3-trimethoxysilylpropyl) isocyanurate, vinyltriethoxysilane, vinyltrimethoxysilane, vinyl-tris(2-methoxyethoxy) silane, vinylmethyl-dimethoxysilane, γ -methacryloxypropyltrimethoxy-silane, β -(3,4-epoxycyclohexyl) ethyltrimethoxy-silane, γ -glycidoxypropyltrimethoxysilane, γ -mercaptopropyltrimethoxysilane, organo-modified polydimethylsiloxane, γ -ureidopropyltrialkoxysilane, γ -ureidopropyltrimethoxysilane, γ -isocyanatepropyltriethoxysilane, or mixtures thereof.

92. (New) The optical fiber according to claim 90, wherein the adhesion promoter (e) is represented by the following structural formula (IV):



wherein the groups R, which may be identical to or different from each other, are chosen from: alkyl, alkoxy or aryloxy groups or from halogen atoms, on condition that at least one of the groups R is an alkoxy or aryloxy group; n is an integer between 1 and 6 inclusive; X is a group selected from nitrous, mercapto, epoxide, vinyl, imido, chloro,

$-(S)_mC_nH_{2n}-Si-(R)_3$ wherein m and n are integers between 1 and 6 inclusive and the groups R are defined as above.

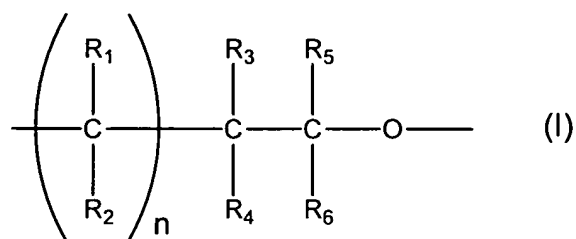
93. (New) The optical fiber according to claims 90, wherein the adhesion promoter (e) is present in the radiation curable composition in an amount of 0.1% by weight to 2.5% by weight with respect to the total weight of said radiation curable composition.

94. (New) A radiation curable composition comprising:

- (a) from 50% by weight to 95% by weight with respect to the total weight of said radiation curable composition, of at least one ethylenically unsaturated polyurethane having a glass transition temperature (T_g) between -40°C and -100°C ; and
- (b) from 5% by weight to 50% by weight with respect to the total weight of said radiation curable composition, of at least one polyfunctional reactive diluent monomer.

95. (New) radiation curable composition according to claim 94, wherein the ethylenically unsaturated polyurethane (a) is obtained by reacting the following compounds:

- (A) at least one polyol compound comprising a structural unit represented by the following formula (I):



wherein n is an integer comprised from 0 to 4 inclusive; R₁, R₂, R₃, R₄, R₅ and R₆, which may be equal or different from each other represent a hydrogen atom or a C₁-C₄ alkyl group;

- (B) at least one polyisocyanate compound; and
- (C) at least one (meth)acrylate compound containing at least one hydroxyl group.

96. (New) The radiation curable composition according to claim 94, wherein the polyfunctional reactive diluent monomer is selected from ethylene glycol di(meth)acrylate, tetraethylene glycol di(meth)acrylate, propanediol di(meth)acrylate, 1,4-butanediol di(meth)acrylate, trimethylolpropane di(meth)acrylate, trimethylolpropane tri(meth)acrylate, neopentyl glycol di(meth)acrylate, 1,6-hexanediol di(meth)acrylate, 1,6-hexamethylenedihydroxy di(meth)acrylate, polyethylene glycol di(meth)acrylate, polypropylene glycol di(meth)acrylate, hydroxypivalic acid neopentyl glycol ester di(meth)acrylate, trimethylolpropane tri(meth)acrylate, trimethylolpropanetrioxyethyl (meth)acrylate, tricyclodecanedimethanol di(meth)acrylate, dicyclopentadiene di(meth)acrylate, pentaerythritol tri(meth)acrylate, pentaerythritol tetra(meth)acrylate, pentaerythritol trioxyethyl (meth)acrylate, pentaerythritol tetraoxyethyl (meth)acrylate, di(meth)acrylate of a diol, the addition compound of ethylene oxide or propylene oxide

with bisphenol A, hydrogenated bisphenol A glycidyl ether of bisphenol A, or mixtures thereof.

97. (New) The radiation curable composition according to claim 94, further comprising at least one polymerization initiator (c).

98. (New) The radiation curable composition according to claim 97, wherein the polymerization initiator (c) is selected from benzophenone, benzoin, benzoinisobutyl ether, benzyl, benzoinethyl ether, 2,2-dimethoxy-2-phenylacetophenone, xanthone, fluorenone, 4-chlorobenzophenone, triphenylamine, carbazole, 3-methylacetophenone, 4,4'-dimethoxybenzo-phenone, 4,4'-diaminobenzophenone, Michler's ketone, benzoin propyl ether, acetophenone diethyl ketal, benzoin ethyl ether, 1-hydroxycyclohexylphenyl ketone, 2-hydroxy-2-methylpropiophenone, 4'-isopropyl-2-hydroxy-2-methylpropiophenone, α,α -dichloro-4-phenoxy-acetophenone, benzyl dimethyl ketal, 2,2-diethoxyacetophenone chlorothioxantone, 2-isopropylthioxantone, diethylthioxantone, 3,3-dimethyl-4-methoxybenzophenone, 2-methyl-1-[4-(methylthio)phenyl]-2-morpholinopropanone, α -hydroxycyclohexylphenyl ketone, 2,4,6-trimethylbenzoyldiphenylphosphine oxide, or mixtures thereof.

99. (New) The radiation curable composition according to claim 97, further comprising at least one photo-sensitizer (f).

100. (New) The radiation curable composition according to claim 99, wherein the photo-sensitizer (f) is selected from amines, ureas, phosphorus compounds, sulfur compounds, nitrils, or mixtures thereof.

101. (New) The radiation curable composition according to claim 90, further comprising at least one monofunctional reactive diluent monomer (d).

102. (New) The radiation curable composition according to claim 101, wherein the monofunctional reactive diluent monomer (d) is selected from 2-hydroxyethyl (meth)acrylate; 2-hydroxypropyl (meth)acrylate; 2-ethylhexyl (meth)acrylate; butoxyethyl (meth)acrylate; tetrahydrofurfuryl (meth)acrylate; linear or branched alkyl (meth)acrylates; butyl (meth)acrylate, octyl-(meth)acrylate, decyl (meth)acrylate, tridecyl (meth)acrylate, stearyl (meth)acrylate, lauryl (meth)acrylate, isodecyl (meth)acrylate; n-hexyl (meth)acrylate; cyclohexyl (meth)acrylate; isobornyl (meth)acrylate; ethoxylated alkyl (meth)acrylates; methoxyethyl (meth)acrylate, ethoxyethyl (meth)acrylate, butoxyethyl (meth)acrylate, 2-(2-ethoxyethoxy)ethyl (meth)acrylate; dicyclopentenyl (meth)acrylate; diethylene glycol (meth)acrylate; ethoxydiethylene glycol (meth)acrylate; benzyl (meth)acrylate; polyethylene glycol (meth)acrylate; polypropylene glycol (meth)acrylate; methoxypolyethylene glycol (meth)acrylate; methoxypolypropylene glycol (meth)acrylate; 2-phenoxyethyl (meth)acrylate; phenoxypolyethylene glycol (meth)acrylate; alkylphenoxyethyl (meth)acrylate; nonylphenoxyethyl (meth)acrylate; alkylphenoxyalkylene glycol (meth)acrylate; 2-hydroxy-3-phenoxypropyl (meth)acrylate; tetra-

hydrofurfuryloxypropylalkylene glycol (meth)-acrylate; dicyclopentenylloxypolyalkylene glycol (meth)acrylate; 2-hydroxyalkyl(meth)acryloyl phosphate; polyfluoroalkyl (meth)acrylate; N-vinyl pyrrolidone; N-vinyl caprolactam; diacetone (meth)acrylamide; isobutoxymethyl (meth)acrylamide; N,N-dimethyl acrylamide; t-octyl (meth)acrylamide; dialkylaminoethyl (meth)acrylate; (meth)acryloylmorpholine; or mixtures thereof.

103. (New) The radiation curable composition according to claim 94, further comprising at least one adhesion promoter (e).

104. (New) The radiation curable composition according to claim 103, wherein the adhesion promoter (e) is an organo-functional silane selected from octyltriethoxysilane, methyltriethoxysilane, methyltrimethoxysilane, tris(3-trimethoxysilylpropyl)isocyanurate, vinyltriethoxysilane, vinyltrimethoxysilane, vinyl-tris(2-methoxyethoxy)silane, vinylmethyl-dimethoxysilane, γ -methacryloxypropyltrimethoxy-silane, β -(3,4-epoxycyclohexyl)ethyltrimethoxy-silane, γ -glycidoxypropyltrimethoxysilane, γ -mercaptopropyltrimethoxysilane, organo-modified polydimethylsiloxane, γ -ureidopropyltrialkoxysilane, γ -ureidopropyltrimethoxysilane, γ -isocyanatepropyltriethoxysilane, or mixtures thereof.

105. (New) The radiation curable composition according to claim 94, having a Brookfield viscosity between 1000 m.Pa.sec and 4000 m.Pa.sec in a temperature range of from 20°C to 80°C.

106. (New) A method for controlling the attenuation losses caused by microbending on the signal transmitted by an optical fiber comprising an internal glass portion, which comprises providing at least one protective coating layer disposed to surround said glass portion, wherein said protective coating layer has a modulus of elasticity value between -40°C and +60°C between 5 MPa and 600 MPa.

107. (New) The method according to claim 106, wherein the modulus of elasticity value between -40°C and +60°C is not higher than 500 MPa.

108. (New) The method according to claim 107, wherein the modulus of elasticity value between -40°C and +60°C is not higher than 450 MPa.

109. (New) The method according to claim 108, wherein the modulus of elasticity value between -40°C and +60°C is not higher than 300 MPa.

110. (New) method according to claim 106, wherein the modulus of elasticity value between -40°C and +60°C is not lower than 8 MPa.

111. (New) The method according to claim 110, wherein the modulus of elasticity value between -40°C and +60°C is higher than 12 MPa.

112. (New) The method according to claim 107, wherein said protective coating layer is obtained by curing a radiation curable composition comprising:

- (a) at least one ethylenically unsaturated polyurethane having a glass transition temperature (T_g) between -40°C and -100°C ; and
- (b) at least one polyfunctional reactive diluent monomer.